



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/688,668 | 10/16/2000 | Richard Ian Laming | DYOUNP0203US | 3601 |

7590

09/03/2003

Don W. Bulson, Esq.
Renner, Otto, Boisselle & Sklar, P.L.L.
19th Floor
1621 Euclid Ave.
Cleveland, OH 44115

20

| EXAMINER |
|----------|
|----------|

ANGEBRANNDT, MARTIN J

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1756

DATE MAILED: 09/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/688,668

Applicant(s)

LAMING ET AL.

Examiner

Martin J Angebrannt

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 4/9/03, 6/5/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 27-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 27-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Art Unit: 1756

1. The response provided by the applicant has been read and given careful consideration.

Responses to the arguments of the applicant are presented after the first rejection to which they are directed. The UK patent application has been received and is of record.

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-11 and 27-37 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claims require the disclosure of GB 2316760 as part of the specification to be enabled. The incorporation of essential material in the specification by reference to a foreign application or patent, or to a publication is improper. Applicant is required to amend the disclosure to include the material incorporated by reference. The amendment must be accompanied by an affidavit or declaration executed by the applicant, or a practitioner representing the applicant, stating that the amendatory material consists of the same material incorporated by reference in the referencing application. See *In re Hawkins*, 486 F.2d 569, 179 USPQ 157 (CCPA 1973); *In re Hawkins*, 486 F.2d 579, 179 USPQ 163 (CCPA 1973); and *In re Hawkins*, 486 F.2d 577, 179 USPQ 167 (CCPA 1973).

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 1756

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3,5-6,8,27-29,31,32 and 34 are rejected under 35 U.S.C. 102(b) as anticipated by Storoy et al. "Single Polarization Fibre DFB Laser", Electron. Lett., Vol. 33(1) (1/1997) or, in the alternative, under 35 U.S.C. 103(a) as obvious over Storoy et al. "Single Polarization Fibre DFB Laser", Electron. Lett., Vol. 33(1) pp. 56-58 (1/1997), in view of Erdogan, et al., "Characterization of UV-Induced Birefringence in Photosensitive Ge-Doped Silica Optical Fibers", JOSA B Vol. 11(10), pp. 2100-2105 (10/1994).

Storoy et al. "Single Polarization Fibre DFB Laser", Electron. Lett., Vol. 33(1) pp. 56-58 (1/1997) teaches the formation of a single polarization DFB laser in a Er doped fiber. These are desirable for coherent communication, spectroscopy and as a reference source as the output is a single frequency (page 57, top left paragraph) The single polarization is the result of induced birefringence in the grating recorded in the fiber. The birefringence is described as being dependent upon the polarization of the UV writing beam. The birefringence is 5% for the s-polarization, which is perpendicular to the axis of the fiber. Conventionally, the gratings are written using p-polarization, which results in only 0.5% birefringence. The technique for writing the gratings is described with respect to reference [4], which is Erdogan, et al., "Characterization of UV-Induced Birefringence in Photosensitive Ge-Doped Silica Optical Fibers", JOSA B Vol. 11(10), pp. 2100-2105 (10/1994). (page 57/ left column, second

Art Unit: 1756

paragraph). The exposure, followed by the tuning of the space between the two gratings for a specific phase shift using UV exposure is disclosed. (page 57/ left column, third paragraph)

Erdogan, et al., "Characterization of UV-Induced Birefringence in Photosensitive Ge-Doped Silica Optical Fibers", JOSA B Vol. 11(10), pp. 2100-2105 (10/1994) teaches the induced birefringence of in optical fibers where the s polarization is defined as where the polarization of the incident UV beam is perpendicular to the axis of the fiber. (pages 2102, left column, experimental section).

The examiner holds that either Storoy et al. "Single Polarization Fibre DFB Laser", Electron. Lett., Vol. 33(1) pp. 56-58 (1/1997) used the methods of Erdogan, et al., "Characterization of UV-Induced Birefringence in Photosensitive Ge-Doped Silica Optical Fibers", JOSA B Vol. 11(10), pp. 2100-2105 (10/1994) which are specifically referred to in the paper and the invention is anticipated or alternatively it would have been obvious to use modify the process of Storoy et al. "Single Polarization Fibre DFB Laser", Electron. Lett., Vol. 33(1) pp. 56-58 (1/1997) used to form the DFB laser by using the methods of Erdogan, et al., "Characterization of UV-Induced Birefringence in Photosensitive Ge-Doped Silica Optical Fibers", JOSA B Vol. 11(10), pp. 2100-2105 (10/1994) based upon the direction to do so.

The applicant argues that the claimed process is to a one step process for forming single mode fiber laser. The examiner notes that the use of "comprising" language opens the interpretation of the claims to additional steps. The examiner notes that there is a difference between the two beam recording methods of Erdogan, et al. and Storoy et al. and the single beam grating used in the disclosure with respect to figure 3a. The examiner notes that the use of two s-polarized beams inherently would be expected to produce equal phase shifts for the modes based

Art Unit: 1756

upon the use of the proper polarization being maintained in the s-polarization **for at least the intermediate article** (before the phase adjusting step). **The applicant might have some evidence that indicates that the two different techniques yield different results. The record of the prior art teaches them to be equivalent. (Byron '442 in column 1)** The examiner notes that there is no requirement for a DFR structure to be formed in the claims. The examiner adopts the position that the phase shift of the two different polarizations is arbitrary based upon the amount of exposure, but equal for both polarizations. The examiner notes that the birefringence is only measured at a single polarization and therefore the reference does not teach away as argued. The position that Erdogan, et al. is not combinable with Storoy et al. ignores the fact that the specific methods is described with reference to Erdogan, et al. The rejection stands.

In the Storoy et al. reference two gratings were written each with the s-polarization. The resulting gratings exhibits birefringence of approximately 5%. This specifically results in a difference in gratings strength, which is a limitation in the instant claims. The reference describes the two gratings as having an arbitrary phase shift between them. This phase shift is adjusted by tuning one of the gratings by exposure to UV light. The result is a single mode fiber. The instant claims are directed to methods of forming a single mode fiber where there is a difference in the gratings strengths of the two orthogonal modes of the fiber to produce strong polarization discrimination. (specification at page 2/lines 7-14). The claims are open to plural exposures, including that of the Storoy et al. reference based upon the use of “comprising” language. The process described in GB9617688.8 (GB 2316760) uses a overlap of successive gratings exposures through a photomask to form the pattern as illustrated in figures 2a-c and 3a-b. The result of the process described in GB 2316760 is a single DFB grating, rather than two

Art Unit: 1756

separate gratings with a phase difference between them such as described in the Storoy et al. reference. The phase shift induced by the UV exposure would be the same for both polarizations, but the refractive index variation in the steps making up each grating differ in their strengths. The birefringence of the grating and the strength of the phase shift occurring in the grating structure are two different things. The process of GB 2316760 uses plural exposures, but only grating exposures, so in the case of the DFB grating formed, these are more closely interrelated than when a separate exposure is used. The arbitrary phase shift produced in the grating exposures of GB 2316760 are the same for both modes, just not the desired result. The claims do not even recite a DFB grating being formed. The examiner holds that currently, the instant claims are either anticipated or rendered obvious by the Storoy et al. reference and the rejection stands.

To obviate this rejection and those dependent upon it, the applicant should incorporate a detailed description of the technique from GB 2316760, in place of the reference on page 4 at lines 27-29 as required under 35 USC 112 and insert the language describing the use of plural grating exposures with stepping or movement between the exposures to form a DFB grating with the recited differences in grating strength and identical phase shifts for the two orthogonal polarization modes.

2. Claims 1-6 and 8-11, 27-32 and 34-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Storoy et al. "Single Polarization Fibre DFB Laser", Electron. Lett., Vol. 33(1) pp. 56-58 (1/1997) **alone or combined with** Erdogan, et al., "Characterization of UV-Induced Birefringence in Photosensitive Ge-Doped Silica Optical Fibers", JOSA B Vol. 11(10), pp. 2100-2105 (10/1994) as discussed above, in view of Byron '442.

Byron '442 teaches the writing of gratings while applying strain to the fiber. This allows a uniform period grating mask to be used to record chirped gratings (abstract, columns 2-3). The varying of the tension in either stepwise or continuous manner is described (3/1-3). The use of a frequency doubled argon ion laser with an output of 244 nm is disclosed as useful for writing the gratings. (3/25-31)

In addition to the basis provided above, the examiner holds that it would have been obvious to one skilled in the art to modify the invention of Storoy et al. "Single Polarization Fibre DFB Laser", Electron. Lett., Vol. 33(1) pp. 56-58 (1/1997) **alone or combined with** Erdogan, et al., "Characterization of UV-Induced Birefringence in Photosensitive Ge-Doped Silica Optical Fibers", JOSA B Vol. 11(10), pp. 2100-2105 (10/1994) as discussed above by using the 244 nm output of the frequency doubled Argon ion and/or placing strain on the fiber during grating recording as taught by Byron '442 based upon equivalent function for the laser wavelength choice and to form chirped gratings using a uniform period grating mask.

The rejection stands for the reasons above.

6. Claims 1-11 and 27-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Storoy et al. "Single Polarization Fibre DFB Laser", Electron. Lett., Vol. 33(1) pp. 56-58 (1/1997) **alone or combined with** Erdogan, et al., "Characterization of UV-Induced Birefringence in Photosensitive Ge-Doped Silica Optical Fibers", ", JOSA B Vol. 11(10), pp. 2100-2105 (10/1994), in view of Byron '442 as discussed above and further in view of Dong et al. '197.

Dong et al. '197 describes Yb/Er doped fibers as more desirable due to their 100 fold larger absorption over Er only systems. (2/1-10)

Art Unit: 1756

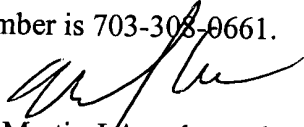
In addition to the basis provided above, the examiner holds that it would have been obvious to one skilled in the art to modify the invention of Storoy et al. "Single Polarization Fibre DFB Laser", Electron. Lett., Vol. 33(1) pp. 56-58 (1/1997) **alone or combined with** Erdogan, et al., "Characterization of UV-Induced Birefringence in Photosensitive Ge-Doped Silica Optical Fibers", ", JOSA B Vol. 11(10), pp. 2100-2105 (10/1994), in view of Byron '442 by using the more sensitive Yb/Er fibers based upon the disclosure by Dong et al. '197 that they have a higher absorption.

The rejection stands for the reasons above.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebrannndt whose telephone number is 703-308-4397. The examiner can normally be reached on Mondays-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.


Martin J Angebrannndt
Primary Examiner
Art Unit 1756

September 2, 2003